AMENDMENTS TO THE CLAIMS

Claims 1-27 (Canceled)

Claim 28 (Newly Added): A fluorescence biosensor chip comprising:

a substrate;

at least one electromagnetic radiation detection device arranged in or on the substrate;

an optical filter layer arranged on the substrate; and

an immobilization layer arranged on the optical filter layer and immobilizing capture molecules,

wherein the electromagnetic radiation detection device, the optical filter layer, and the immobilization layer are integrated in the fluorescence biosensor chip.

Claim 29 (Newly Added): The fluorescence biosensor chip as claimed in claim 28, wherein the substrate is produced from silicon material.

Claim 30 (Newly Added): The fluorescence biosensor chip as claimed in claim 28, wherein the at least one electromagnetic radiation detection device has a photodiode arranged such that electromagnetic radiation of a first wavelength range is detected.

Claim 31 (Newly Added): The fluorescence biosensor chip as claimed in claim 30, wherein the optical filter layer reflects and/or absorbs electromagnetic radiation of a second wavelength range, at least part of the first wavelength range lying outside the second wavelength range.

Claim 32 (Newly Added): The fluorescence biosensor chip as claimed in claim 28, wherein the optical filter layer has at least one bandpass filter and/or at least one cut-off filter.

33 (Newly Added): The fluorescence biosensor chip as claimed in claim 32, wherein the bandpass filter is a dielectric interference filter having a layer sequence comprising at least two materials, a first material having a high refractive index and a second material having a low refractive index.

Claim 34 (Newly Added): The fluorescence biosensor chip as claimed in claim 32, wherein the cut-off filter is a color filter produced from an organic material.

Claim 35 (Newly Added): The fluorescence biosensor chip as claimed in claim 33, wherein the first material is one or a combination of chemical elements and compounds selected from the group consisting of titanium oxide, silicon nitride, hafnium oxide, zirconium oxide, aluminum oxide, polysilicon, indium tin oxide, and silicon dioxide.

Claim 36 (Newly Added): The fluorescence biosensor chip as claimed in claim 32, wherein the second material is one or a combination of chemical elements and compounds selected from the group consisting of titanium oxide, silicon nitride, hafnium oxide, zirconium oxide, aluminum oxide, polysilicon, indium tin oxide, and silicon dioxide.

Claim 37 (Newly Added): The fluorescence biosensor chip as claimed in claim 28, wherein the immobilization layer has one or a combination of materials selected from the group consisting of silicon dioxide, silicon nitride, gold, and organic material.

Claim 38 (Newly Added): The fluorescence biosensor chip as claimed in laim 28, further comprising a circuit layer arranged between the substrate and the optical filter layer and electrically coupled to the at least one electromagnetic radiation detection device, wherein at least one electrical component is integrated into the circuit layer.

Claim 39 (Newly Added): The fluorescence biosensor chip as claimed in claim 38, wherein the circuit layer electrically drives the at least one electromagnetic radiation detection device.

Claim 40 (Newly Added): The fluorescence biosensor chip as claimed in claim 28, further comprising a multiplicity of capture molecules coupled to the immobilization layer, wherein a molecule that is to be detected and is complementary to the capture molecules can be coupled to each of the capture molecules.

Claim 41 (Newly Added): The fluorescence biosensor chip as claimed in claim 40, wherein the capture molecules are selected from the group consisting of nucleic acids, peptides, proteins, and low-molecular-weight compounds.

Claim 42 (Newly Added): The fluorescence biosensor chip as claimed in claim 40, wherein a surface section of the immobilization layer is free of the capture molecules so that a noise signal can be tapped off at the at least one electromagnetic radiation detection device arranged below the surface section.

Claim 43 (Newly Added): The fluorescence biosensor chip as claimed in claim 40, wherein each molecule to be detected has at least one fluorescence marker that absorbs electromagnetic radiation of a third wavelength range and, after absorption has been effected, emits electromagnetic radiation of a fourth wavelength range;

wherein at least part of the third wavelength range lies outside the fourth wavelength range, and at least part of the fourth wavelength range lies within the first wavelength range.

Claim 44 (Newly Added): The fluorescence biosensor chip as claimed in claim 43, wherein the fluorescence marker is selected from the group of materials consisting of coumarin, FITC, Cy2, Alexa Fluor 488, BODIPY 493, Rhodamine 123, R6G, TET, JOE, HEX, BODIPY 530, Alexa 532, R-phycoerythrin, TRITC, Cy3, TAMRA, Texas Red, ROX, BODIPY 630, and Cy5.

Claim 45 (Newly Added): The fluorescence biosensor chip as claimed in claim 30, wherein at least one isolation trench for optically isolating adjacent electromagnetic radiation detection devices is introduced into at least one surface region of the fluorescence biosensor chip, the at least one isolation trench extending through the immobilization layer into a region of the optical filter layer

such that an electromagnetic radiation detection device is arranged below each region between each of two adjacent isolation trenches.

Claim 46 (Newly Added): The fluorescence biosensor chip as claimed in claim 45, wherein at least part of the surface of the at least one isolation trench is covered with a layer made of an absorbent material, or the at least one isolation trench is filled with the absorbent material, wherein the absorbent material absorbs or reflects electromagnetic radiation at least of the first wavelength range.

Claim 47 (Newly Added): The fluorescence biosensor chip as claimed in claim 38, wherein a barrier layer made of an absorbent material is provided in at least one region of the circuit layer, and an electromagnetic radiation detection device is arranged below each region between each of two adjacent barrier layers, wherein the absorbent material absorbs or reflects electromagnetic radiation at least of a respective wavelength range.

Claim 48 (Newly Added): A fluorescence biosensor chip arrangement comprising:

a fluorescence biosensor chip having:

a substrate;

at least one electromagnetic radiation detection device arranged in or on the substrate and detecting radiation of a first wavelength range;

an optical filter layer arranged on the substrate and absorbing and/or reflecting electromagnetic radiation of a second wavelength range; and

an immobilization layer arranged on the optical filter layer and immobilizing capture molecules,

wherein the electromagnetic radiation detection device, the optical filter layer and the immobilization layer are integrated in the fluorescence biosensor chip; and

an electromagnetic radiation source irradiating a surface region of the fluorescence biosensor chip with electromagnetic radiation of a third wavelength range.

Claim 49 (Newly Added): The fluorescence biosensor chip arrangement as claimed in claim 48, wherein the electromagnetic radiation source is selected from the group consisting of a laser, a light-emitting diode, a gas discharge lamp, and an incandescent lamp.

Claim 50 (Newly Added): The fluorescence biosensor chip arrangement as claimed in claim 48, wherein the fluorescence biosensor chip has a multiplicity of capture molecules coupled to the immobilization layer, wherein a molecule that is to be detected and is complementary to the capture molecules can be coupled to each of the capture molecules.

Claim 51 (Newly Added): The fluorescence biosensor chip arrangement as claimed in claim 50, wherein the molecules to be detected and/or the capture molecules have a fluorescence marker that at least partially absorbs electromagnetic radiation of the third wavelength range and, after absorption has been effected, emits electromagnetic radiation of a fourth wavelength range;

wherein at least part of the third wavelength range lying outside the fourth wavelength range, and at least part of the fourth wavelength range lying within the first wavelength range.

Claim 52 (Newly Added): The fluorescence biosensor chip arrangement as claimed in claim 48, wherein at least part of the first wavelength range lies outside the second wavelength range.

Claim 53 (Newly Added): The fluorescence biosensor chip arrangement as claimed in claim 50, wherein the electromagnetic radiation source emits electromagnetic radiation incident at a predeterminable angle with respect to the direction of the normal to the optical filter layer.

Claim 54 (Newly Added): The fluorescence biosensor chip arrangement as claimed in claim 51, wherein the electromagnetic radiation source emits electromagnetic radiation in pulses, and the electromagnetic radiation detection devices detect the electromagnetic radiation emitted by the fluorescence markers in time intervals between the pulses.